5.3 Interpreting and Sketching Graphs

LESSON FOCUS Describe a possible situation for a given graph and sketch a possible graph for a given situation.

Make Connections

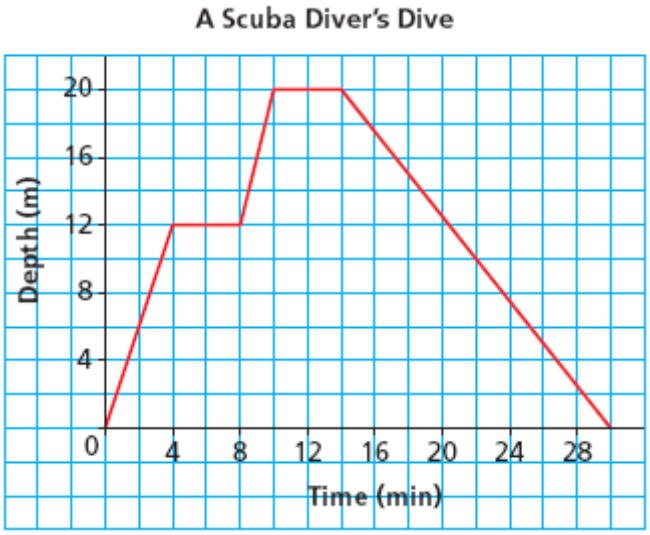
In math, a graph provides much inf
This graph shows the depth of a scu
a function of time.

How many minutes did the dive last

At what times did the diver stop her

What was the greatest depth the div

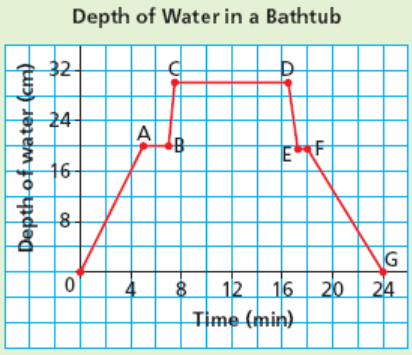
For how many minutes was the dive
depth?



TRY THIS

Work with a partner.
You will need grid paper.

This graph shows the depth of water in a bathtub as a function of time.



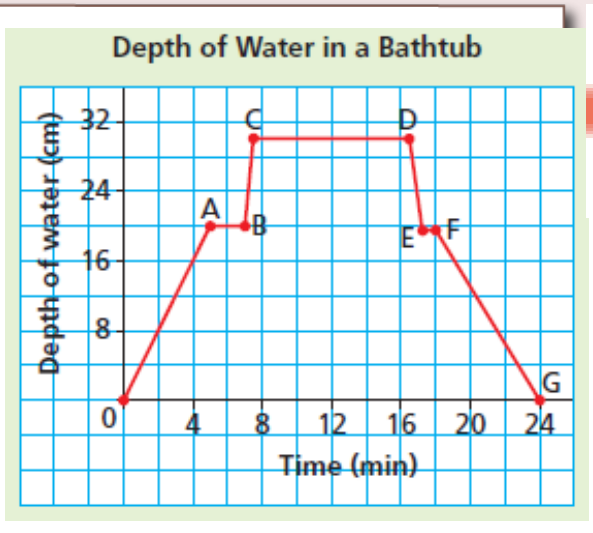
A. What does each segment of the graph represent? Compare your description with that of your partner. Are both your stories the same? Should they be? Explain.

TRY THIS (continued)

B. Sketch a graph to represent this situation:
You put the plug in the bath and turn on the taps.
You leave the bathroom and return to discover that the bath has overflowed.
You turn off the taps and pull out the plug to let out some water. You put the plug back in.

C. Compare your graph with that of your partner. How are the graphs the same? How are they different?

What does segment OA represent?
What does segment AB represent?
What does segment BC represent?
What does segment CD represent?
What does segment DE represent?
What does segment EF represent?
What does segment FG represent?



Is the graph always described the same way? Should it be? Explain.

Pg. 281 # 4, 6, 7, 9

Wednesday, November 16

- Warm-up
- Finish going over Section 5.3 interpreting and sketching graphs
- Practice Questions
- Go over yesterday's homework

Quiz on what we've done so far on Friday!

Please bring your graph paper to class for now on! You will need it for many of your upcoming classes.

Warm-up # 6

#1 Answer the following questions for each relation:

/3 a) (2,3) (5,4) (6,7) (1,4) (0,5)

/3 b) (5,2) (0,1) (9,7) (3,7) (0,5) (6,-1)

-Is it a function?

-State the domain and the range.

#2 State which of the following would be the dependent variable

a) Brushing your teeth and cavities

b) Hours worked and money earned

/2

#3 Write T = 2b + 90 in function notation and find the following:

a) T(3) = ?

/4 b) T(b) = 100

Ex: #14 a & b

Warm-up #

#1 Answer the following questions for each relation:

/3 a) (2,3) (5,4) (6,7) (1,4) (0,5) ✓ → D = 0,1,2,5,6 R = 3,4,5,7

/3 b) (5,2) (0,1) (9,7) (3,7) (0,5) (6,-1) ✗ D = 0,3,5,6,9 R = -1,1,2,5,7

-Is it a function?

-State the domain and the range.

#2 State which of the following would be the dependent variable

/2 a) Brushing your teeth and cavities

b) Hours worked and money earned

#3 Write T = 2b + 90 in function notation and find the following:

/2 a) T(3) = ?

/2 b) T(b) = 100

a) T(b) = 2b + 90

T(3) = 2(3) + 90 ←

T(3) = 96

b) T(b) = 2b + 90

100 = 2b + 90

−90 −90

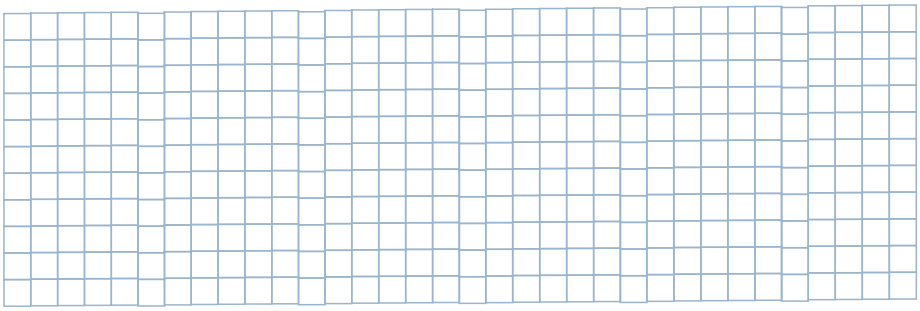
10 = 2b

2 2

b = 5

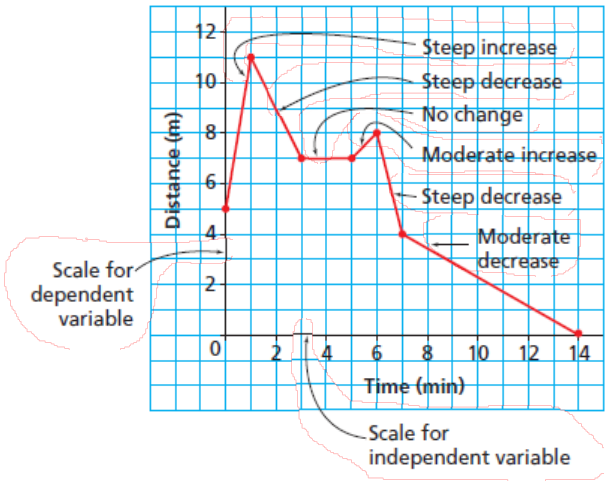
Sketch a graph to represent this situation:

You put the plug in the bath and turn on the taps.
You leave the bathroom and return to discover that the bath has overflowed.
You turn off the taps and pull out the plug to let out some water.
You put the plug back in.



How are the graphs the same? How are they different?

The properties of a graph can provide information about a given situation.



Example 1 Interpreting a Graph

Each point on this graph represents a bag of popping corn. Explain the answer to each question below.

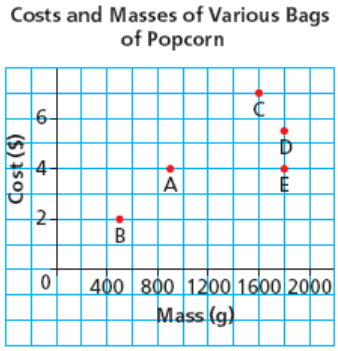
a) Which bag is the most expensive? What does it cost?

b) Which bag has the least mass? What is this mass?

c) Which bags have the same mass? What is this mass?

d) Which bags cost the same? What is this cost?

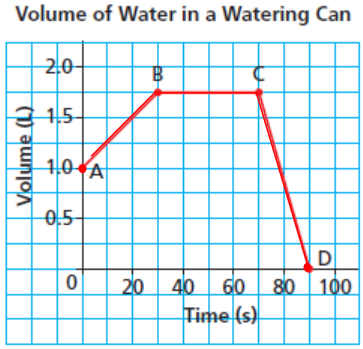
e) Which of bags C or D has the better value for money?



SOLUTION

CHECK YOUR UNDERSTANDING

The graph shows how the volume of water in a watering can changes over time.



Examp

Describe t
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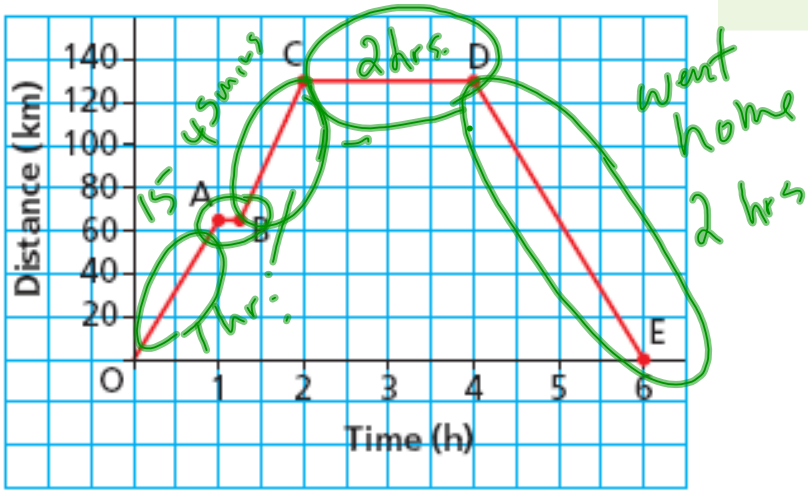
The distanc
Winnipeg a

SO

Day Trip from Winnipeg to Winkler, Manitoba



CHECK YOUR UNDERSTANDING

Example 3 Sketching a Graph for a Given Situation

Samuel went on a bicycle ride. He accelerated until he reached a speed of 20 km/h, then he cycled for 30 min at approximately 20 km/h. Samuel arrived at the bottom of a hill, and his speed decreased to approximately 5 km/h for 10 min as he cycled up the hill. He stopped at the top of the hill for 10 min.

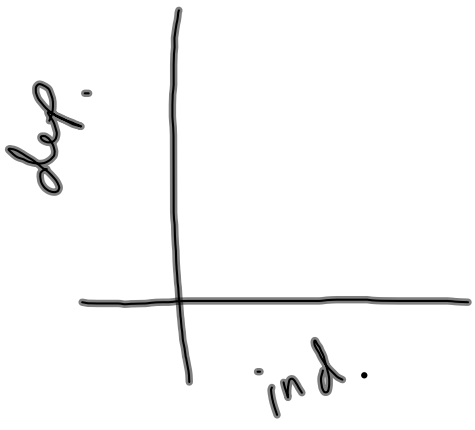
Sketch a graph of speed as a function of time. Label each section of the graph, and explain what it represents.

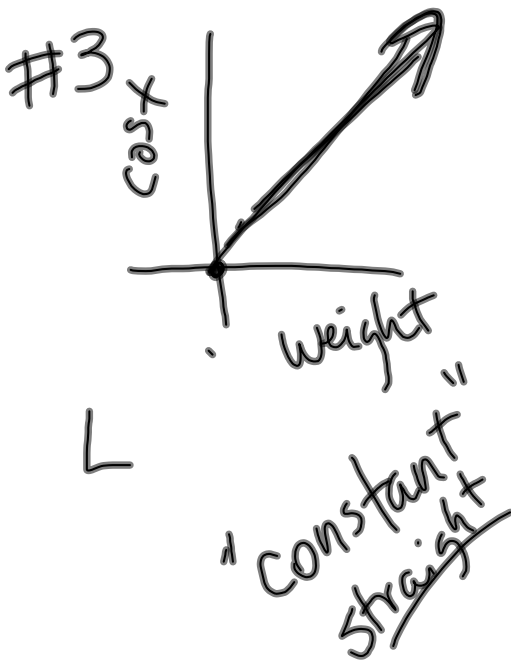
CHECK YOUR UNDERSTANDING

SOLUTION

Discuss the Ideas

1. For a graph of distance as a function of time, what does each segment represent?
   - a horizontal line segment
   - a segment that goes up to the right
   - a segment that goes down to the right
2. For a graph of speed as a function of time, what does each segment represent?
   - a horizontal line segment
   - a segment that goes up to the right
   - a segment that goes down to the right





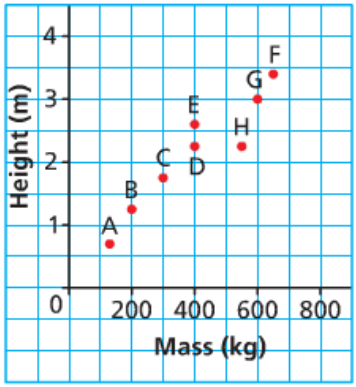
Complete Practice Questions:

Pg.281 #3 to 11

You may have already completed # 4,6,7,9

3. Each point on the graph represents a polar bear.
Explain the answer to each question below.

Heights and Masses of 8 Polar Bears



a) Which bear has the greatest mass? F
What is this mass? 650Kg

b) Which bear is the shortest? What is its height? A, 0.7m

c) Which two bears have the same mass? D, E.
What is this mass? 400Kg

d) Which two bears have the same height? D, H
What is this height? 2.25m

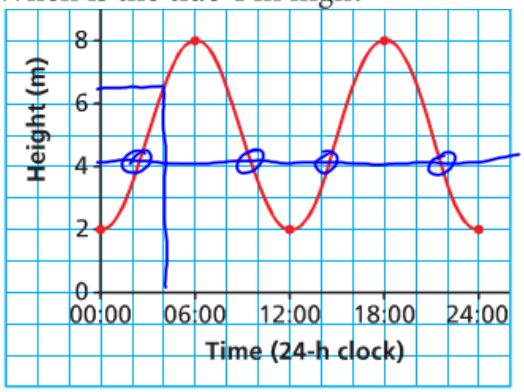
8m

a) What is the greatest height? At what times does it occur? 6 am, 6 pm

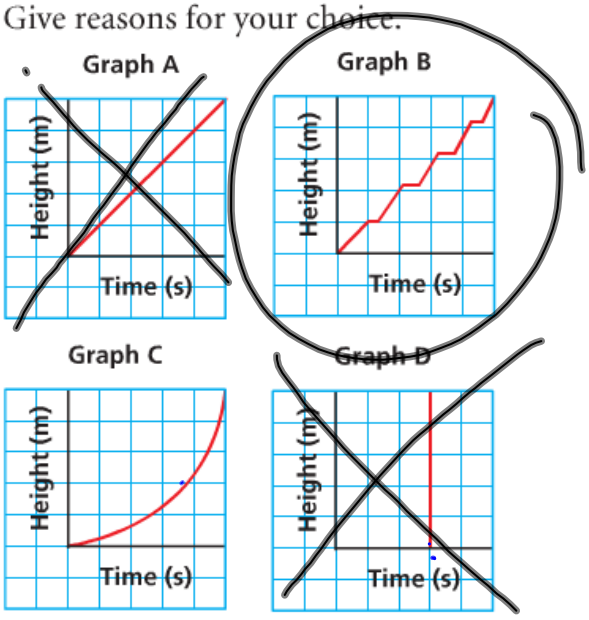
b) What is the least height? At what times does it occur? 2m, midnight, noon,

c) How high is the tide at 04:00? 6.5m

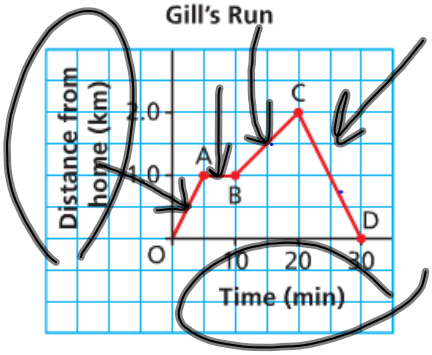
d) When is the tide 4 m high?



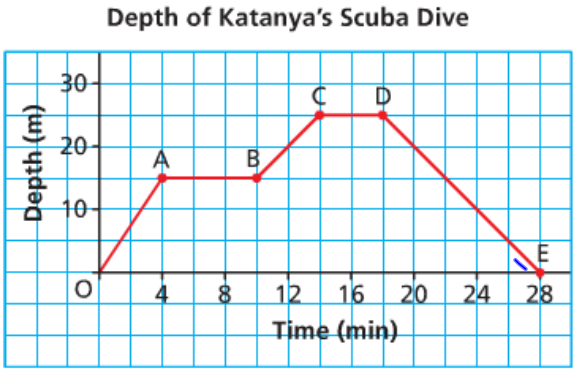
5. To raise a flag, Sepideh pulls the rope steadily with both hands for a short time, then moves both hands up the rope and pulls again. She does this until the flag has been raised. Which graph best represents the height of the flag? Give reasons for your choice.



6. Gill runs for exercise. This graph shows her distance from home during one of her runs. Describe Gill's run for each segment of the graph.



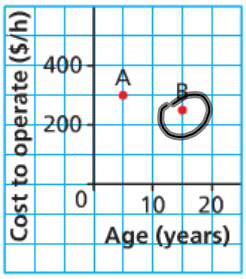
7. Katanya went scuba diving in Egypt. This graph shows her depth below sea level as a function of time on one of her dives.



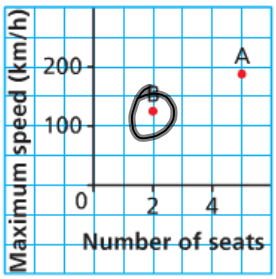
Write all that you know about the dive from the graph.

8. Point A and Point B represent the same helicopters in each of these graphs.

Graph of Cost against Age



Graph of Maximum Speed against Number of Seats



e)

Which statements are true? Justify your answers.

a) The older helicopter is cheaper to operate. T

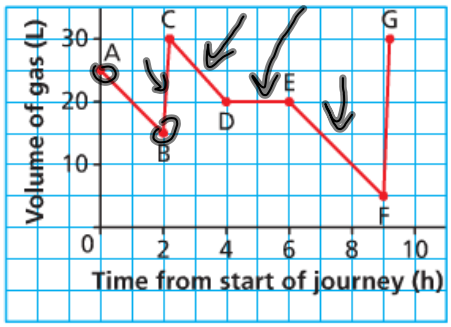
b) The helicopter with more seats has the lower maximum speed. F

c) The helicopter with the lower maximum speed is cheaper to operate. T

d) The helicopter with the greater maximum speed is older. F

9. **a)** Describe what is happening for each line segment in this graph.

Volume of Gas in a Snowmobile



b) How much gas was in the tank at the start of the journey? Was the tank full at this time? Explain. 25 L No

10. An oven is turned on at a room temperature of 20°C and it takes 10 min to reach a temperature of 190°C. A tray of cookies is placed in the oven to bake for 10 min. The oven is then turned off and returns to room temperature after 15 min. Sketch a graph of temperature as a function of time. Label each section of the graph and explain what it represents.